

How To Read A VFR Sectional Chart

Disclaimer: I am not a Certified Flight Instructor, nor a Basic or Advance Ground Instructor. Below is just to help myself to better gain knowledge about read sectional charts. This is what I've used to refresh myself on sectional charts and has been a learning experience about reading a chart more in depth. There may be errors; if they are pointed out I will fix them.



This is an overview of the main area I look at when going off my sectional chart. It has a bunch of congested areas and different airspaces.

AIRSPACE**Class B**

This is the markings of a Class B airspace, specifically Boston Airport. The blue lines show the different levels and the blue text (pictured more closely) definite the limits of each "shelf." The Bravo airspace is normally described as an upside down wedding cake (more than two layers)



This is the circle around any Class B airspace that is 30 nautical miles. It is called the Mode C Veil, which requires any aircraft flying within 30nm of a Class B to have a Mode C altitude encoding transponder. ATC must be able to tell the altitude of your aircraft even if they are not talking to you due to the volume of traffic in the area. If you are required to have the right equipment to enter this space, yet you are not within the Bravo airspace yet and do not need to be cleared into the Mode C Veil area.

## Class C



This is the markings of a Class C airspace. The magenta lines define the inner and outer "shelf." Pictured more closely is the magenta text that define the limits of each area. This one defines the inner core from the surface to 4100ft.

## Class D

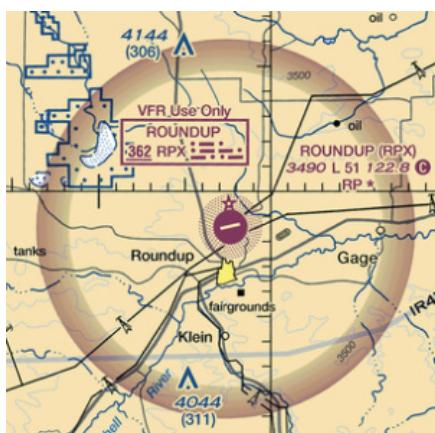


This is a Class D airport, it is the blue dashed lines. It also has a VOR at the airport which is the bigger blue solid line with radial marks for the VOR. The Class D is not necessarily a perfect circle, as you can see with this one. Above is the limit of the Class D airspace since there is only one area until like Class B/C airspaces so surface to the number in the box is assumed. Class D is typically Surface to 2,500ft MSL as it is at Bridgeport but I've included examples where it is higher due to terrain, they are all equivalent to 2,500ft AGL.

## Class E



This airspace is a Class E - surface to 700ft AGL. Unlike other airspaces, this class is always those vertical limits. Do not get confused by the VOR near this airport, it is blue but the dashed magenta circle is the limits of the airspace. I know when I look quickly you may see the blue and assume it is Class D airspace, so always check the colors and the line is dashed not hashed.



This is Class E airspace too, but now it starts at 700ft to 1200ft. Class E is the hardest airspace to read on the sectional, since it has many denotations. This is mainly to help IFR flights with ATC contact since they wouldn't get that in Class G airspace. Roundup airport is in Class G airspace under the Class E. It is surround by Class E airspace starting at 700ft to help IFR traffic approach the airport for landing.

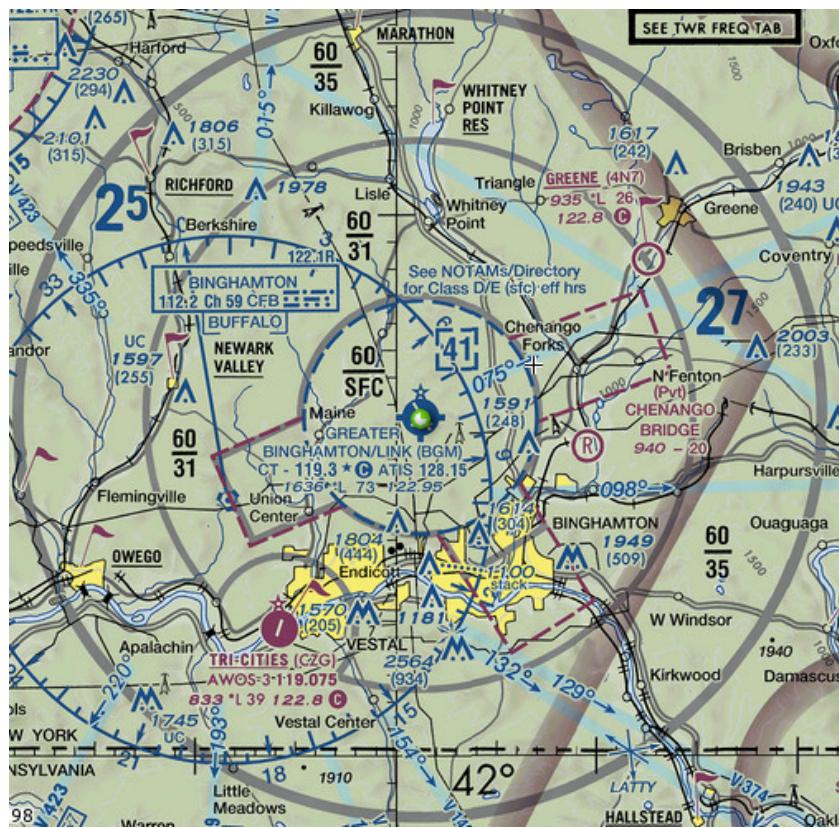


This is also Class E airspace, but it starts at 1,200ft. In the Northeast, you won't see this on sectional charts because it is *assumed*. It is a very congested area with lots of air traffic all airspace is at least Class E starting at 1,200ft. This symbol is more common out west where these are less dense areas.



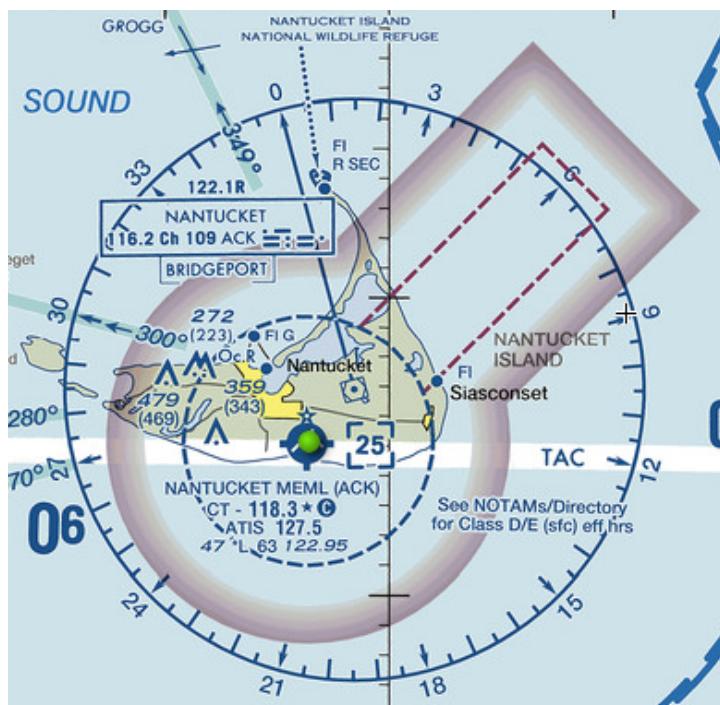
This is the last Class E marking you'll find on a sectional. This blue zipper line is when Class E is denoted, but it doesn't have a standard altitude. You can see on either side of this 1700MSL and 5500 MSL it's where the Class E starts on either side of the zipper line.

## TRSA



Above is a TRSA airspace - Terminal Radar Service Area. It's an optional class C airspace - in a way. You are highly encouraged to talk to approach, but you don't have to talk to them. The inner ring (which you can see to the right) is a Class D airport - you have to talk to ATC. You can see the blue dashes underneath the black line to define the D airspace.

## Combination Airspace



This is a nice combo of airspace markings. The airport is a class D (blue dashed line) while the rectangle off of it is Class E (surface to 700ft AGL) because of the magenta dashed lines. The magenta solid line is Class E (700ft to 1200ft AGL). The reason for this weird airspace combo: it's only a part-time tower, so an IFR flight can talk to a controller all the way to the ground. The Class E is even lined up with the runway. It's also important to know the Class E takes over when the Class D Tower is closed.

## OBSTACLES



This is a group of obstacles (the M shape means more than one.) The numbers besides is MSL. The AGL height is not always available. It is less than 1000ft AGL.



This is a group of obstacles with its AGL height shown and the symbol (lightening bolt shapes) above it means it is lighted at night or in bad weather.



Another single obstacle with the MSL shown, but it is unlit. The AGL is in the parentheses. If it is less than 1000ft AGL, the obstacle does not have AGL shown on the sectional.



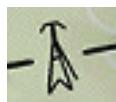


This is a group of obstacles that is higher than 1000ft AGL (notice the different shape, the top of the M is skinnier and longer) and it is lit at night or in bad weather (the lightening bolts) Up in the left hand corner you'll see again the MSL height and (AGL in parentheses.)



A new symbol for me when updating this, it's a windmill! Sorry, wind turbine. MSL (AGL) and the UC stands for under construction. I think we'll see more of these popping up on the charts now.

### PILOTAGE POINTS



I'm a city girl so had no idea what these looked like. They are power lines, these little guys are all over my sectional. Good for check points, also good to know around airports.



This is the symbol for a racetrack, no specific kind but they are pretty visible from the sky no matter if they're for cars, horses, dogs, whatever.



This is a stadium, another nice symbol to use for a checkpoint! Though definitely check for TFRs if there is a game going on for a big team!



This is for mining. I'm *assuming* its more for a quarry than for an actual mine since that'd be less visible from the sky.



Took me a google search for this one, a lookout tower! It has an elevation next to it too.



This is an expressway and great for planning your pilotage checkpoints. They even give you the number, if you're familiar with the area.

### AIRPORTS



This is the symbol for an abandoned airport. It is on the chart so you can use it as a checkpoint or not to confuse it with an open airport near it.



This is a controlled airport because it is blue. The three squares at the East, South, and West points of the circle mean it has fuel services available. The star signifies it has a beacon from sunset to sunrise.



Restricted airport symbol. It is for emergency use or authorization from specific person or agency.



This is the marking for a helipad. Helicopters can land at this airport, but planes cannot. They won't have enough room for you to land, so don't land here!



This is a public use airport with no hard-surface runway longer than 1,500 feet. It has limited or no attendance.



Uncontrolled airport without fuel services, it is just a circle. You can see that it only has one runway by where the background of the sectional shows in the middle where the runway is.



Uncontrolled airport with fuel services and a beacon from sunset to sunrise. It has fuel due to three squares (it would be four without the beacon) and a star on the top signifies an airport with a beacon.



This is a seaplane airport. The same symbols apply for this, as you can tell it has fuel services.



Since this anchor doesn't have a circle around it, it is not a normal seaplane airport. It is only used for seaplane emergencies.



You can see this airport is labeled as a private airport as told by the (Pvt) above the name, Calverton Exec. You can tell it's an uncontrolled airport due to the magenta color of the runway outlines. The difference this airport just has the runways outlined versus a circle around the entire airport. That means one runway is greater than 1,500ft in length. If it is controlled airport, the lines are blue. As you can also see, Calverton is where they have skydivers!

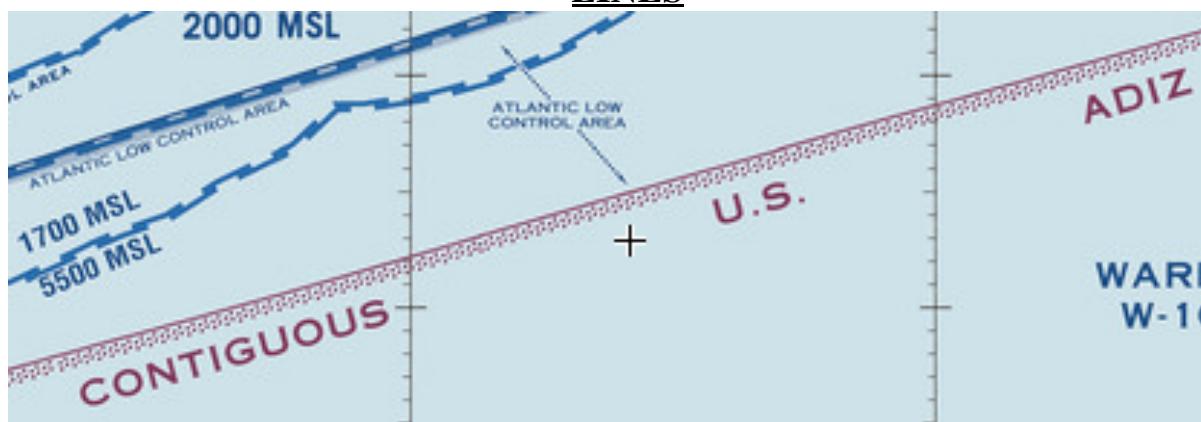


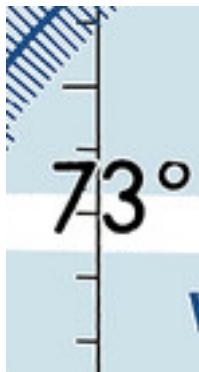
This is just the information of an uncontrolled airport (because it's written in magenta, it is uncontrolled). You have the name of the airport (followed by code in parentheses). This airport has the Automatic Weather Observing Station

(AWOS) and lists its frequency. Next line says the altitude of the airport - 108 ft. It is lighted, which is denoted by the L, the star in front of it means the lighting operations are limited so check the A/FD. 25 is telling you the length of the longest runway in hundreds of feet. Lastly, is the CTAF frequency. The C is denoting it's the CTAF.

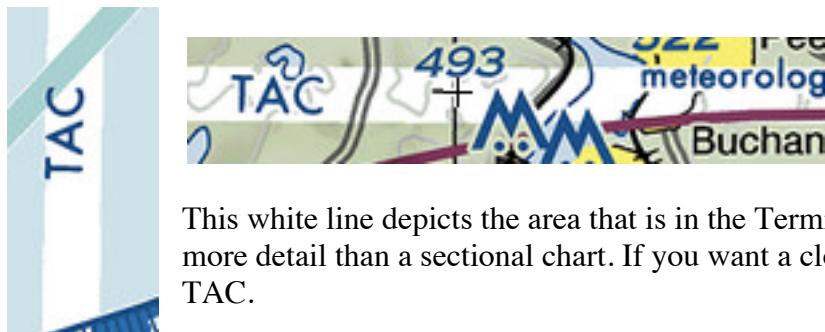


### LINES

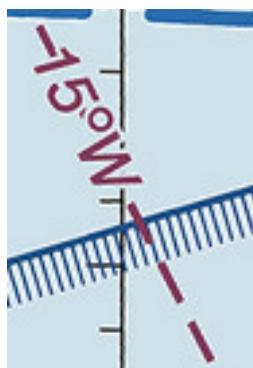




This is a longitude line on a sectional. You can see it marked at 73 degrees. The biggest problem I had when taking my written to say where something was located in degrees is that the half way mark would be 73'30" NOT 73'50" You need to think of it as a clock. The hash marks are in seconds out of 60 NOT 100 and that's the biggest thing to remember when finding latitude and longitude.



This white line depicts the area that is in the Terminal Area Chart, which goes into more detail than a sectional chart. If you want a closer view of this area see the TAC.



This dashed magenta line define the magnetic variation for this area of the sectional., not to be confused with Class E starting at the surface dashed lined around airports. It is also called an isogonic line. This specific one is 15 degrees west. I like to use my E6B to confirm that west you add 15 to the True Course, and east you subtract is from True Course.



This black dashed line is pretty simple. It is the state line depicted on the chart. Here you can see the separation of Connecticut and New York. This one is over the water, but in other sections it will be over land.



This line shows a normal area over water that would be uncontrolled but controlled airspace has been extended to the line. It is used by my airspace for vectoring by ATC into JFK airport. It is considered Class E airspace.



This is an international border, more specifically the Canada/United States border near Maine. It's magenta with a black dashed line under it. Don't go past it or you could get in some serious trouble!

## NAVIGATION



I couldn't find it on a sectional, but this is just a VOR.



This is a VOR-DME, it's a more enhanced VOR and will also tell you the distance you are away from it.



This is a VORTAC. It's a VOR and a TACAN together. TACAN is just used for military so isn't important to civil pilots.



This is the information for any VOR/DME/VORTAC. It has the name, navigation frequency. The three letter identifier and the Morse code to confirm you have the right frequency. This also has HIWAS denoted by the H in the right corner.



This is a NDB pictured without an airport (as above in the airport section). The information is similar to the VOR's information. I've never used a NDB, and my plane does not have an ADF so can't really go into the points of how to use this information on your ADF.



The magenta flag symbolizes a VFR reporting point. In black letting is the name of the reporting point. This one specifically I use when I call Tower on my way back from the south practice area. It lets Tower know where you are, especially if you don't know the exact mileage away you are.

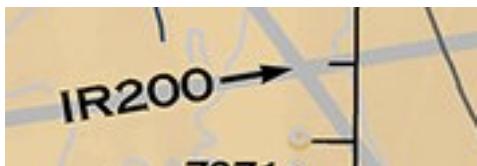


This is a stand alone VFR waypoint. They all have five letter identifiers (If it starts with VP means it's for VFR.) It is to be used as a supplemental navigation aid, not as a primary one. I've never used one as a checkpoint yet.

## AIRWAYS



Military VFR airway. The VR means it is VFR, and the light black line is the airway.



This is also a military VFR airway, but it is for IFR traffic as denoted by the IR before the numbers. Again, it is a light black line that denotes the airway.



This is a Victor airway, this is used for civilian air traffic. It also says the radial the airway is on (269). It is important to know that these airways are 8 nautical miles wide - 4 nm on either side.



This symbol confused me at first. It is the intersection of airways, but sectionals don't show all the airways, which is why you only see only light blue line. You see only one airway when there are actually three intersecting here.



This is a Victor airway, but the box below with 51 in it. The 90 denotes the mileage between NAVAIDS on direct airways.

## IN-AIR HAZARDS



You've seen this symbol/airport before, it's Calverton. I'm not focusing on that little parachute now. It means that there are people parachuting frequently in this area. If you are talking to ATC they'll give you a heads up, but be careful anyway.



This is to denote that there are gliders that operate in the area, another thing to look out for. Remember they have the right of way, unless you're in distress.



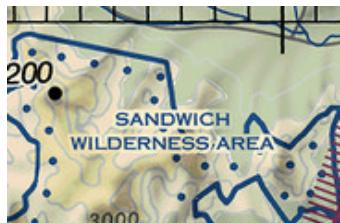
Similar to the glider symbol, but notice this has an "H" instead of a "G." It is saying there are hang gliders in the area so watch out for them.



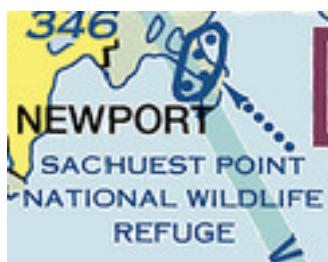
Again, very similar to the two above this one but this is for ultralight aircraft denoted by the "U" so when you're planning a flight it is important to make sure you note which letter is used so you know what you'll be looking for!



These numbers (well, not these specifically) are all over sectional charts. They are telling you how high the highest obstacle is and the altitude you'll pass 300ft over it safely. This area would be 4600MSL



This is marking a wilderness area on the sectional. Stay above 2,000ft AGL when flying over this area.



This is the marking of a wildlife refuge. You can see the name of the refuge and the circle with the dots on the inside is the actual area of the wildlife refuge, stay above 2,000ft AGL when flying over this area.

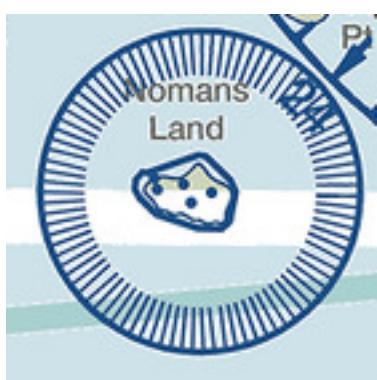


This, specifically, are the Catskill Mountains. This is how mountain ranges look on a sectional chart. You can notice the lines that tell the shape of mountains and also the different colors, which signify different levels of terrain. Be aware when flying over this area and don't hit any mountains!

## MILITARY/SPECIAL AIRSPACE



This is a prohibited airspace. It's the most restricted airspace. No aircraft is allowed in it, even with ATC clearance. The one pictured is Camp David, so I'm sure some presidential helicopters are allowed in there. You can see it can also expand and it is important to check the NOTAMs. It will be denoted by the blue marks and a "P"



This is a restricted airspace, and if you contact the controlling agency a certain number of hours beforehand you may be allowed into the airspace. The FAA restricts this airspace due to "the existence of unusual, often invisible, hazards to aircraft such as artillery firing, aerial gunnery, or guided missiles." Make sure you get clearance or avoid this airspace for your own safety. It is denoted with those blue hash marks and "R"



This is a warning area, denoted with a "W". Warning areas are over normally over domestic or international waters. In this area, it contains activity that may be hazardous to nonparticipating aircraft. This marking is used to warn nonparticipating pilots.

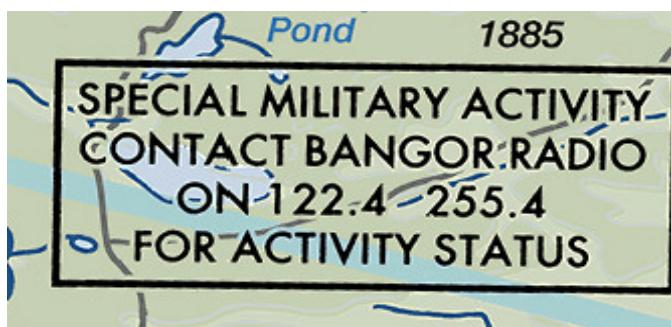


This is a Military Operations Area. Military aircraft maybe operating within excess of 250 knots below 10,000ft. ATC will provide clearance or reroute for IFR traffic in the area. VFR traffic should call the nearest FSS within 100 miles for real time information about what is happening in the area.

VFR pilots should exercise extreme caution and should contact the controlling agency for traffic advisories.

**OTHER**

I found this while searching around on the sectional. Hazardous Laser Transmissions, surface to infinity. Crazy stuff! I never saw it before so always get an updated chart!



This is different from a MOA, it is special military activity space. I found it up near Maine. It's grey hatching instead of magenta like MOA. Just pay close attention to the color and find if there is an information box like this one has.

